REMARKS

By this Amendment, claim 1 is amended, and claims 7-15 added. Support for the amendment to claim 1 and new claims 7-10 is found on page 4, lines 16-19, support for new claims 11 and 12 is found on page 4, lines 20-21, and support for new claims 13-15 is found on page 4, lines 22-26, so that no issues of new matter are raised by these new claims.

In the Office Action, claims 1-6 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite due to the phrase recited on lines 1 and 2. By this Amendment, applicants have adopted the Examiner's suggested language for clarity. The claims are now definite, and it is requested that the rejection be withdrawn.

Claims 1-6 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,830,990 to Honer et al. (Honer) in view of JP 2002-205180 (JP 180) and in view of U.S. Patent No. 5,354,695 to Leedy (Leedy). The Office Action notes that Honer discloses a dicing apparatus with expanding tape, JP 180 discloses laser dicing, and Leedy describes cutting a wafer into dice, picking up the die, and bonding it to substrate. The Office Action asserts that it would have been obvious to substitute a laser dicing device in the place of Honer's saw because laser die cutting is well known and a laser provides a clean cut without producing sawing debris. The Office Action further states that combining dicing and bonding is well known, as shown by Leedy.

Claim 1 recites a die bonder which mounts dies on a base, piece by piece. Each die has a surface on which a semiconductor device is formed. The die bonder comprises a laser machining part which causes laser light to become incident from a surface of a wafer before dividing into individual dies so that the laser light forms a modified region within the wafer, wherein the wafer is divided into individual dies in the laser machining part. Claim 1 further adds an expanding part that widens a gap between the individual dies after the laser light forms the modified region within the wafer. The die bonder of claim 1 allows brittle wafer material to be cut with laser light without chipping. However, the individual cut die are positioned very close to the adjacent dies after cutting. The claimed expanding part widens the gap between the individual dies after cutting to avoid contact with adjacent dies when each die is picked up for bonding.

None of the applied prior art references, even when modified as suggested in the Office Action, discloses the combination of features of claim 1.

The Office Action correctly recognizes that Honer does not disclose laser dicing. In fact, Honer's assembly is particularly designed to handle the issues relating to separating die made from a wafer with a **dicing saw**. Because silica dust and water coats the wafer during cutting with a dicing saw, Honer cuts the wafer only part way through, cleans the wafer, then applies stretchable material to the back of the wafer, and stretches the tape to cause the wafer to separate along the partial saw cuts. The stretchable material is used specifically when dies are cut with a dicing saw to effect separation by stretching, not cutting, and to prevent contaminants from contacting the front of the wafer.

The Office Action suggests that it would have been obvious to substitute a laser dicing device in Honer's assembly to provide a clean cut without producing sawing debris. However, such a substitution, if it could be properly made, would also eliminate the need for the stretchable material, which deals with the sawing debris and makes the final separation. Further, there is no suggestion in the prior art for replacing Honer's dicing saw assembly with laser beam machining or to use laser beam machining with an expanding device. The mere existence of laser beam machining does not provide an adequate suggestion for making the proposed modification.

Leedy is referenced for showing that dicing and bonding can be present in a single apparatus. However, Leedy merely notes that conventionally cut dice may be picked up with a pick and place bonding tool. (See col. 46, line 67 – col. 47, line 3.) There is no suggestion in Leedy for modifying Honer as proposed in the Office Action. Leedy does not suggest of using an expanding device and does not remedy the deficiencies of the combination of Honer and JP 180.

None of the prior art specifically suggests of the combination of a die bonder that mounts dies on a base, piece by piece, in combination with a laser machining part. Moreover, none of the prior art shows or suggests a die bonder having the combination of a laser machining part and an expanding part that widens the gap between individual

dies after the laser light forms a modified region within the wafer. Accordingly, claim 1 is allowable over the prior art and the rejection should be withdrawn.

Claims 2-6, which depend from claim 1, are allowable for at least the above reasons and for the additional features recited therein. New dependent claims 7-15 are also allowable for the above reasons and due to the additional combination of features recited in these claims. For example, none of the prior art references discloses or suggests providing a die bonder as set forth in claim 1 with an expandable stage, a frame pusher, a pushup device and a bonding part as recited in these new claims.

While this application should now be in condition for allowance, in the event that any issues should remain after consideration of this response which could be addressed through discussions with the undersigned, then the Examiner is requested to contact the undersigned by telephone for that purpose. In this regard, the Examiner's attention is directed to the new correspondence address and telephone number indicated below and on the accompanying Change of Address notice.

Respectfully submitted,

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